

The specimens before me seem to be quite distinct from all the other American species of *Pinnotheres*. From *P. ostreum* they differ in the non-dilated penultimate joint of the first pair of ambulatory legs, and in the much shorter dactyli of the second ambulatory legs; from *P. maculatus* in the form of the carapace and the much shorter dactyli of the fifth ambulatory legs; from *P. Guérinii* and *P. hirtimanus*, M.-Edwards, both from Cuba, in the non-spatulate dactyl of the outer maxillipedes; and from the latter also in the non-ciliated inferior margins of the chelæ. *P. margarita*, Smith, from the Bay of Panama, is at once distinguished by its pubescent carapace and legs; *P. lithodomi*, Smith, from the same locality, by the form of the merus joint of the outer maxillipedes and the proportionate length of the dactyli of the ambulatory legs.

MOLLUSCA OF H.M.S. 'CHALLENGER' EXPEDITION.—Part V.
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[Read April 15, 1880.]

Families and Genera.

SOLENOCONCHIA, viz. *Siphodentalium honoluluense* (omitted).

TROCHIDÆ, viz. *Trochus* (omitted).

HETEROPHROSYNIDÆ*, viz. *Jeffreysia*.

LITORINIDÆ, viz. *Echinella*, *Lacuna*, and *Fossarus*.

CERITHIIDÆ, viz. *Cerithium*, *Litiopa*, and *Cerithiopsis*.

THIS group of shells includes some inadvertently omitted before, two families sparingly and unsatisfactorily represented, and a considerable number of Cerithiidæ. They are chiefly from shallow water, and need little remark. I may therefore take the opportunity to say a word regarding the identification of 'Challenger' specimens with known species, a work already embracing over six hundred species, and now nearly completed. This work of identification, with the labour of hunting up references, even though no such exhaustive citation of authors as is suitable for a monograph of a limited group has been attempted, has been a

* This formidable name of Clerk's is adopted here in preference to Gray's name of *Rissoellidæ*, in deference to the arguments of Dr. Gwyn Jeffreys, who assures me, 1st, that Clerk's name has priority (of which I am not quite convinced); and, 2nd, that *Rissoella*, Gray, was founded on *Pyramis glabrus* (sic), Brown, "which is evidently an *Odostomia*."

very heavy task. From the study of this material a few points stand out with special prominence.

1. Depth is an important condition of molluscan life. That is to say, there really are shallow and deep water species and genera, though their bathymetric limits are not absolutely constant.

To some this may seem too self-evident and universally accepted a proposition to need statement. Such would have been the case some years ago; but dredgings from the deep sea have presented facts which demanded a revisal of received opinions on this point; and while the result in the main cannot be said ever to have been doubtful, and while the evidence of other branches of natural history has already been obtained in this same sense, it is desirable also to record the witness of the Mollusca of the 'Challenger' expedition.

2. Temperature, even more than mere depth, seems an important condition in molluscan life.

It is needless to speak here of other conditions, such as light, or food, or oxygen, because, though there are extreme differences in these respects, and though their influence must be very great, still their precise amount, and the nature and direction of their effects, are too little known to afford foundation for more than guessing.

Pressure seemed likely to form a very important condition in marine animal life; the enormous figures representing the square-inch amount of that pressure stirred men's imagination, and their fancies were supported by the fact that rapid transference to the surface from even a moderate depth destroys life; but these impressions were removed by a remembrance of the laws of hydrostatic pressure, and by substituting a gradual for a rapid transition from deep water to the surface. Temperature, however, remains as an undoubtedly important factor.

3. Great differences in these respects of depth and temperature prove barriers to distribution.

4. Great length of time naturally helps escape from these barriers, for in the lapse of years accidents are likely to occur enabling species to evade difficulties which would in ordinary circumstances prove insurmountable. Hence the finding of a living species in a fossil state will always justify the expectation of its having a wide local distribution.

5. Where barriers of depth and temperature do not check distribution, there seems, in ordinary circumstances, no limit to universality of distribution.

6. There actually are existing species whose distribution is universal, no barriers having availed against their passage.

7. Still there is no trace, even in these species, of essential, lasting, and progressive change.

I do not intend to overpress this point, for I allow that it presents merely negative evidence. I do not assert that there are *no* species of Mollusca which have essentially, permanently, and progressively changed. I only say there are some, even many, which have *not* done so, that I do not know any which have, and that the burden of proof lies with those who assert the positive. Evolutionists are in the way of saying that a thing being possible, is therefore probable, and consequently is true unless the contrary be proved. I only wish to note that this is a reversal of all the laws of evidence in any case of fact whatever, and to add that, so far as I have had opportunity of observation, no proof has reached me of progressive, permanent, and essential change in molluscan development.

In accomplishing so much as I have already overtaken, I have been aided kindly, often, and in many ways, by Mr. E. A. Smith, of the British Museum, who has, in the case of myself, as of many others, helped with his great knowledge of the Museum collection, and his large acquaintance with the literature of the subject. I very gladly take this opportunity also of offering my thanks to Dr. J. Gwyn Jeffreys, to Dr. H. Woodward, to Prof. Seguenza, to Prof. G. O. Sars, to Prof. v. Martens, to the Marquis de Monterosato, to Mr. William Dall, to Mr. Marrat, and to many other friends.

SIPHODONTALIUM, *Sars*.

8. *S. honoluluense*, n. sp.

8. SIPHODONTALIUM HONOLULUENSE, n. sp.

July 1875. Reefs off Honolulu. 40 fms.

Shell.—Cylindrical, bent and attenuated from about the middle to the apex, toward the mouth very slightly contracted; of a dull white translucency, and not glossy. *Sculpture*. The surface, especially toward the apex, is faintly marked by microscopic, remote, oblique, raised, encircling rings, parallel to which there are fine scratches in the intervals. *Edge* of the mouth very oblique, blunt. *Apex* not small, broken. Length 0·21; breadth, greatest 0·031, at mouth 0·028, at apex 0·016.

This species closely resembles *S. tetraschistum*, W.; but, besides the obvious difference in size, that species is a little more cylindrical and is much more strongly and uniformly sculptured. I say nothing of the peculiar feature of the apex of that species, because, the point being broken in the solitary specimen of the present species, comparison is impossible.

TROCHUS, L.

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| 17. <i>T. (Gibbula) leaensis</i> , n. sp. | 20. <i>T. (S.) lamprus</i> , n. sp. |
| 18. <i>T. (Ziziphinus) arruensis</i> , n. sp. | 21. <i>T. (S.) albugo</i> , n. sp. |
| 19. <i>T. (Solariella) philippensis</i> ,
n. sp. | |

17. TROCHUS (GIBBULA) LEAENSIS, n. sp.

Oct.-Dec. 1873. Lea Point, Cape Town.

Shell.—Small, conoidal, scalar, having a rounded periphery, a flattened base, no umbilicus, and with purple spiral threads on a dull whity ground. *Sculpture*. The whole surface is longitudinally obliquely striate, in hair-like puckerings; of spirals there are on the last whorl above the corner of the mouth 7 purple threads; they are pretty equal, and are parted by furrows as wide as themselves; the third and fourth are somewhat stronger than the others, and the three last, at the periphery, are closer than the others. In some of the upper furrows traces of other fine spirals can be seen. Within the base lies one purple thread, and inside of this there are nine feebler, flatter, more crowded spirals, surrounding the closed, umbilical depression. *Colour*. A ruddyish white, with dark purple spirals above; those on the base, with the exception of the exterior one, being uncoloured; the apex is yellow. *Spire* conoidal, with a slightly raised rounded apex. *Whorls* 6, small, the last tumid, the earlier ones rounded, a little flattened below the suture; the embryonic whorls two, minute, smooth, rather immersed. *Suture* linear, but strongly marked by the angulation of the whorls. *Mouth* round, but pointed above, and with an angulation at either end of the pillar. *Outer lip* thin, sharp, and coloured by the purple spirals. *Inner lip* sharp, on the edge of the pillar, round which it is reflected and flattened, extending on the umbilicus in a small, thin, defined pad. There is a slight obtuse tooth near the front of the pillar. *Inside* dull, with a bright nacreous border within the dull extreme edge. *Umbilicus* closed, but with a marked depression. H. 0·2. B. 0·22, least 0·175. Penultimate whorl 0·065. Mouth, height 0·125, breadth 0·11.

In many respects this species is very like *T. zonatus*, Wood (= *T. menkeanus*, Phil.), but than that species this is much smaller and higher; the last whorl, which is the sixth in both, is here much smaller and narrower, and the umbilicus is not covered by the broad semicircular plate which characterizes that species. In that, too, the coloured bands above are fewer and are very unequal, and there are three of these on the base. *T. (G.) fulgens*, Gould, is not unlike, but is higher, and the spirals are more numerous and smaller.

18. *TROCHUS (ZIZIPHINUS) ARRUENSIS*, n. sp.

Sept. 18, 1874. Arru Islands, S.W. of Papua.

Shell.—Conical, carinated, with a flattened base, strong, opaque, covered with tubercles, and coloured with grey and pink. *Sculpture*. There are eight spiral rows of small round tubercles on each whorl. The tubercles on the first two rows are larger than the others; these, as well as the next three rows, are parted by distinct depressions; the lowest three rows are much closer together, but project a little, especially the centre and largest row of the three. On the base there are about nine less strongly tubercled spiral threads, with feebler threads between, these intermediate threads becoming feebler towards the centre. The tubercles are smooth and polished, but the whole intervening surface is sharply fretted with fine oblique puckerings. *Colour* white, beautifully flecked above with greyish-purple blotches, and closely spotted with purplish pink on the base. *Spire* high and sharp-pointed, its concavely conical slope being slightly broken at the sutures by the projection of the two superior rows of tubercles. *Whorls* about 10, flat and of very regular increase. *Suture* slight, but distinct, being defined by the slight carinal spiral above, and the double row of larger tubercles below. *Mouth* rather small, square and very oblique. *Outer lip* sharp but strong. *Inner lip* strengthened internally by a buttress of porcellaneous nacre, which ends abruptly towards the point of the pillar, forming a tooth. The pillar, bevelled off to a sharp edge, is pressed back on the umbilicus, which it completely closes, leaving only a central depression and a postcolumellar furrow. *Operculum* thin, yellow, normal. H. 0·64. B. 0·58, least 0·52. Penultimate whorl 0·18. Mouth, height 0·42, breadth 0·3.

This species very much resembles *T. decoratus*, Phil., but that species is more highly narrowly conical, is flatter on the base, and the whole system of spirals is different. In *T. decoratus* also the earlier

whorls are simply spiralled; here the spirals are cross hatched. *T. nobilis*, Phil., is much larger, is flatter on the base, and is not so closely spiralled. *T. euglyptus*, Ad., has the whorls much rounder.

19. *TROCHUS* (*SOLARIELLA*) *PHILIPPENSIS*, n. sp.

St. 161. April 1, 1874. Off the entrance to Port Phillip, Australia. 38 fms. Sand.

Shell.—Rather like *T. tumidus*, but with a broader base, more conical, and less scalar, with a large open umbilicus and brilliant colour. *Sculpture*. The shell is gathered into small regular flat puckers below the suture; these are weaker on the last whorl. The whole surface is covered with very fine oblique longitudinal striæ. *Spirals*. There are very numerous, fine, sharp, undulating scratches, which on the middle of the base are shallower and wider apart, but toward the umbilicus again become sharper and more crowded. Within the umbilicus are four or five somewhat beaded spirals, the first and strongest of which forms an umbilical carina. *Colour* faintly iridescent all over, creamy white, flecked with zigzag lines of crimson, which on the upper whorls are narrow and regular, on the penultimate whorl are remote, and on the last are irregular, broken, and crowded. On the base there are eleven to twelve elongated radiating crimson spots. The first three whorls are a pale orange-yellow. *Spire* rather high, scalar. *Apex* small, bluntly pointed. *Whorls* $6\frac{1}{2}$, with a flat shelf below the suture, angulated at about $\frac{1}{5}$ of their breadth, and rounded from the angulation to the suture. The last whorl is bluntly angulated at the edge of the rounded base. *Suture* strong, being slightly impressed and very distinctly marked by the angle at which the adjoining whorls meet. *Mouth* little oblique, round. *Outer lip* thin and sharp, not at all expanded. *Inner lip* thin and sharp, a very little patulous on the pillar, where it also retreats a little, so as to form a slight open sinus; brilliantly iridescent within. *Umbilicus* wide and pervious, and deeply impressed at the suture, which runs spirally up to the apex within. H. 0·275. B. 0·33, least 0·3. Penultimate whorl 0·085. Mouth, height 0·15, breadth 0·14.

Solariella is a MS. generic name of Searles Wood, published in his Catalogue of Crag Moll. in 1842, and suppressed by him as a mere synonym of *Margarita* in his Crag Moll. (Pal. Soc.) vol. I. p. 134. Adams revives it in his 'Genera' as a subgen. of *Monilea*, with which it has nothing specially to do; but it may not be amiss

to retain it for the Australian group of Trochidæ, whose brilliant colours distinguish them from the *Margaritas*. There is a *Margarita tasmanica* of Tenison Wood, from Bass Straits, which, from his description, seems to present some features of resemblance to this species; but he says of it that the upper part of the whorls is not angulated. Than *T. angulatus*, A. Ad., this Port Philip species is much larger and higher. It approaches most nearly to *T. bellula*, Ang.; but that is larger, with the same number of whorls, has a transparently white apex, has the shoulder below the apex not flat nor drooping outwards, but gouged out as a concave depression, the last whorl is more spread out, and the base is without colour, the umbilicus is wider and less deep, and the spiral which defines it is stronger, while there are no other spirals within it; the whole surface of the shell, too, is smooth, with a few strong clean-cut impressed spirals, instead of being closely and minutely fretted with spirals all over.

20. TROCHUS (SOLARIELLA) LAMPRUS, n. sp.

July 29, 1874. Levuka, Fiji. 12 fms.

Shell.—Depressedly conoidal, angulated at the periphery, rounded on the base, umbilicated, polished, finely sculptured, solid. *Sculpture*. The glossy surface is closely fretted with fine, curved, oblique, longitudinal scratches, crossed by very similar but slightly stronger and more equal spirals; these both are stronger near the suture, and feebler on the base, where, indeed, the spirals almost disappear. *Colour* pellucid pale yellowish white, with many narrow, opaque, pure white spirals, which are flecked with fine zigzag brown longitudinal lines, aggregated in spots, and most abundant near the suture. The strongest opaque spiral is at the periphery, and on it are minute linear interruptions of the fundamental colour, and very regularly recurring little brown spots, which are about half the width of their interspaces. On the base the brown spots are very few and minute. There is very little iridescence anywhere. *Spire* low. *Apex* minute and projecting. *Whorls* 6, depressed, equally curved, slightly angulated at the periphery, more flattened on the base than above, of regular, but rather rapid increase. *Suture* slightly depressed. *Mouth* small, round. *Outer lip* thin and perfectly simple. *Inner lip* porcellanous, thick and flat, projecting in a minute ear across the umbilicus, and having toward the point of the pillar a broad backward bevel, cut out of the thickness of the shell round the umbilicus. *Umbilicus*, a shallow open depres-

sion, with a deep narrow hole in the centre. H. 0·15. B. 0·24, least 0·2. Penultimate whorl 0·05. Mouth, height 0·13, breadth 0·1.

The specimen from which this species is derived is not quite full-grown. The whorls are not angulated, nor the umbilicus open, nor is the colour ruddy, nor the texture thin, as in *T. (S.) angulatus*, Ad. From *T. (S.) vitiligineus*, Mke., from which it differs in these respects, but in a less degree, it may further be distinguished by its greater depression, its smaller mouth, its weaker sculpture, its greater glossiness, its feebler iridescence, and its minute umbilicus.

21. *TROCHUS (SOLARIELLA) ALBUGO*, n. sp.

Apr. 17-18, 1874. Port Jackson, Sydney. 2-10 fms.

Shell.—Small, conoidal, with a tumid conical base, bluntly bicarinate, umbilicate, with a resinous lustre, brown, flecked with crimson and white. *Sculpture*. Very many irregular oblique faint lines of growth, with a few remote rounded spirals, which are very weak above, stronger on the base, and of which two at the periphery form a feeble double carina. *Colour*. A pale transparent resinous brown, flecked below the sutures and at the periphery with alternate spots of white and crimson; the latter colour runs in minute zigzag streaks down the shell; there are also, both above and on the base, a few delicate spirals of alternate crimson and white specks. *Spire* rather low, with curved contours and a blunt round apex. *Whorls* 5, rounded and sloping above, flat at the periphery, and tumid on the base. *Suture* linear and very slightly depressed. *Mouth* rather large, round. *Outer lip* thin. *Inner lip* thin, hollowed out backwards, and bending somewhat across the umbilicus. *Umbilicus* a broad shallow funnel, contracting to a small deep hole. H. 0·125. B. 0·2, least 0·15. Penultimate whorl 0·05. Mouth (in consequence of obliquity), height 0·125, breadth 0·1.

This species differs from *T. lamprus*, W., in being higher, with a larger mouth, and very unlike in colour and in sculpture. It is perhaps most like *T. (S.) vernicosus*, Gould, but that is flatter and has a much wider umbilicus.

ECHINELLA, Swainson.

ECHINELLA (?) *TECTIFORMIS*, n. sp.

St. 235. June 4, 1875. Lat. 34° 7' N., long. 138° E. Japan. Bottom temp. 38°·1 F. 565 fms. Mud.

Shell.—High, conical, tectiform, carinated, umbilicated, with a flattish depressedly conical base. *Sculpture*. There are many sinuous, rather remote, longitudinal puckerings, minute below the suture; then evanescent, but on the whole lower half of the whorls rising into rarer, narrow, sharply rounded riblets, separated by flat intervals of fully twice their width; on the carina they rise into sharpish little longitudinal tubercles; below this they rapidly and almost wholly disappear, showing on the base only as slight undulations marking the very curved lines of growth. Besides these there are minute round threads which fret the whole surface. *Spirals*. The base of each whorl is thrown out into a narrow sharp expressed carina, which is rendered more prominent both by the longitudinal tubercles and by the imbrication of the whorls, which project markedly above the suture; the whole surface of the shell is, moreover, covered with fine unequal rounded threads, which are coarser in proportion to the development of the longitudinal puckerings, and which are crisply crimped by the finer longitudinals. On the base a slight swelling runs round near the outer edge. *Colour* a dead, faintly yellowish, chalky white, but which is not altogether without polish. *Spire* very high and narrow. *Apex* broken. *Whorls*. Only 4 remain, of very regular increase; flatly and very straightly sloping down from the deep suture to the carina, below which they are sharply constricted; each whorl is thus imbricated over the one which succeeds it. *Suture* squarely angulated and deeply impressed. *Mouth* squarely rounded, rather small. *Outer lip* thin. *Pillar-lip* broadly reflected over the umbilicus. *Umbilicus* small but deep, with a narrow swollen edge. H. 0·9 (?). B. 0·65, least 0·58. Penultimate whorl 0·2. Mouth, height 0·25, breadth 0·25.

The only specimen of this species is badly broken, so that the measurements, that of height in particular, are somewhat imaginary. It is so remarkable a form, however, that it is well worth preservation and description. In the absence of apex, operculum, and animal, its generic place is somewhat doubtful. The texture of the shell rather suggests a *Solarium*, but its extraordinarily high and narrow form, its almost poriform umbilicus, and the character of its sculpture point more to *Echinella*. In shape it resembles *Helix Schrammi*, Fischer (Journ. de Conch. 1858, p. 184, pl. vii. f. 8), more than any thing else I know.

LACUNA, *Turton*.1. *L. picta*, n. sp.2. *L. (Hela) margaritifera*, n. sp.

1. LACUNA PICTA, n. sp.

St. 122. Sept. 10, 1873. Lat. $9^{\circ} 5' S.$ to $9^{\circ} 10' S.$, long. $34^{\circ} 49' W.$ to $34^{\circ} 53' W.$ 350 fms. Mud.

Shell.—Pointedly and squarely subglobose, small, thin, translucent, dull yellowish with crimson stains. *Sculpture*. The lines of growth are few, faint, and irregular. *Spirals*. The whole surface is covered with minute, close-set, scarcely raised, rounded threads, about 0.002 in. apart. About $\frac{1}{5}$ of the whorl's breadth below the suture there is a slight angulation, and a still fainter angulation surrounds the base. *Colour* yellowish, with maroon stains markedly on two zones, one below the sutural angulation, the other above that of the base, on both of which there are arrow-headed, irregularly defined blotches, with small irregular zigzags over the whole surface. *Epidermis*. There are traces of an excessively thin horny epidermis. *Spire* rather high. *Apex* small, rounded, and a little flattened and compressed. *Whorls* 5, convex, flattened in the middle, which gives a certain squareness of outline; towards the upper part there is a slight angulation, between which and the suture there is a slight constriction. The mouth is $\frac{2}{3}$ of the whole length. *Suture* distinct and slightly impressed. *Mouth* very perpendicular, oval, bluntly pointed above, and a little squarish from the straightness of the pillar and of the outer lip. The *outer lip* is thin. The *pillar* is narrow, bends a little to the left, is somewhat straight, but is a little excavated, with a slight angulation at its junction with the body and also in front. *Inner lip* crosses the body in a thin glaze; down the pillar it is flat, patulous and sharp-edged, behind it lies the narrow shallow groove-like *umbilicus*, the exterior edge of which, as in the genus generally, is continuous with the outer lip. H. 0.15. B. 0.12, least 0.1. Penultimate whorl 0.04. Mouth, height 0.1, breadth 0.075.

This species a good deal resembles the young of *L. crassior*, Mont., but is smaller, more globose, and much less angulated on the base. It is very like the *L. fragilis*, Mke., but that species is much more membranaceous, has the pillar more curved, and the umbilical groove is wider and larger; the coloration, too, is quite unlike. Dr. J. Gwyn Jeffreys claims this species for his genus *Hela*; or *Cithna*, as he now proposes to call it, *Hela* having

been already used by Münster, in 1830, for a genus of Crustacea—a change this in which it is to be hoped he will not persevere.

2. *LACUNA* (HELA) *MARGARITIFERA*, n. sp.

St. 246. July 2, 1875. 36° 10' N., 178° E. Mid-Pacific, E. of Japan. Bottom temp. 35°·1 F. 2050 fms. Grey ooze.

Shell.—High, conical, strong, white, smooth, with a spiral of small beads just below the suture. *Sculpture*. There are many unequal not strong lines of growth. There are, on the upper part of each whorl, longitudinal puckerings stretching down from the infrasutural row of beads, strongest on the last. The surface is also finely scratched longitudinally. *Spirals* close, below the suture there is a fine beaded thread with a slight spiral furrow below it; there are many rounded, but very slightly raised spiral threads; the whole surface is also finely spirally fretted. *Colour* dead white, procellanous. *Epidermis*. None preserved. *Spire* high and conical. *Apex* broken. *Whorls* 3 (remaining), flatly convex; the last disproportionately long. *Suture* fine, but rather deeply impressed. *Mouth* oval, pointed above and at the end of the pillar, where it is also somewhat patulous, but the little expanded angle there is hardly enough to suggest a canal. *Outer lip* rather strong, very regularly curved from its junction with the body to the point of the pillar. *Pillar* very much curved. *Inner lip* carried across the body by a pretty strong callus, thin, sharp-edged, and projecting on the pillar. *Umbilicus* not large, but a well-marked and clearly defined furrow, whose exterior edge, however, is not, like that of *Lacuna*, continuous with the outer lip. H. 0·2. B. 0·13, least 0·1. Penultimate whorl 0·06. Mouth, length 0·1, breadth 0·07.

This is a much stronger shell than *L. tenella*, Jeffr., usually is; in form it is much higher in the spire, and narrower in proportion to breadth; the whorls are much more compressed, and the narrow sharply impressed suture is much less deep; the mouth is oval, not round, and the sculpture of the surface is very different from the hyaline gloss and texture of that other. It is unfortunate that the apex, which is so characteristic a feature in *L. tenella*, is broken in the 'Challenger' specimen.

FOSSARUS (*Adanson*), *Phil.*

FOSSARUS CEREUS, n. sp.

St. 184. Lat. 12° 8' S., long. 145° 10' E. East of Cape York, Australia. Aug. 29, 1874. Bottom temp. 36° F. 1400 fms. Grey ooze.

Shell.—Globosely conical, not thin, but waxily translucent, with a thin polished yellow epidermis. *Sculpture*. There are many oblique, fine, rather obsolete lines of growth. *Spirals*. There are several irregular, unequally parted, rounded and rather obsolete spiral threads, which are closer on the base. *Colour*. That of the shell is a translucent white; it is covered with a very thin, most persistent, hard, smooth, and horny epidermis. *Spire* somewhat turreted. *Apex* eroded. *Whorls* 3 (remaining), convex, but a little compressed towards the middle, round on the base, of very rapid increase, the mouth being fully two thirds of the whole length. *Suture* deep and irregular, but not canaliculated, except where eroded. *Mouth* oval, bluntly pointed above, glossy within. *Outer lip* thin and sharp, with a very regular curve, prominent on the base, and a little patulous towards the point of the pillar, where it is slightly, openly, and a little obliquely canaliculate. *Pillar* rather short, hollowed above, bending over a little to the left and terminating in a slight oblique tooth, which results from the slight canaliculation in which the mouth terminates, and which, as in *Rissoina*, is hollowed out of the point of the pillar. *Inner lip* porcellaneous white, slightly reverted, and very closely appressed; a very thin glassy layer across the body unites the lips. *Umbilicus* none. H. 0·2. B. 0·19, least 0·15. Penultimate whorl 0·065. Mouth, height 0·17, breadth 0·1.

The generic place of this shell cannot be considered as satisfactorily determined. The whole aspect removes it from *Admete* and even more from *Rissoina*, which presents in a stronger form the basal sinus. The absence of an umbilicus removes it from *Isapis*, of which the *I. fenestrata*, Carp., has a swelling on the pillar-lip, strongly suggestive of this Australian species. On the whole the general appearance of the shell is liker that of a *Fossarus* than any thing else; and though Philippi's generic diagnosis of *Fossarus* (Arch. f. Naturg. vii. 1, 42) gives an edentulate inner lip as a characteristic feature, yet in *Fossarus Adansoni*, which is the original type of the genus, there is a blunt tooth and a slight sinus or groove on the front of the pillar. As to the large umbilicus which is constantly attributed to the *F. Adansoni*, it is often a mere chink, and occasionally it is quite absent. Of an epidermis, I confess I have never seen a trace. In the absence of animal and operculum it is better to avoid the creation of a new genus, though this may probably be necessary in the end; and I am glad in this difficult classification to have the support of Dr. J. Gwyn Jeffreys.

JEFFREYSIA, *Alder*.

JEFFREYSIA EDWARDIENSIS, n. sp.

St. 145a. Dec. 27, 1873. Lat. $46^{\circ} 41'$ S., long. $38^{\circ} 10'$ E. Prince Edward Island, between Cape of Good Hope and Kerguelen. 50 to 150 fms.

Shell.—Tumidly conical, flattish on the base, thin, glassy. *Sculpture*. The whole glossy surface is covered with extremely fine lines of growth, and with still fainter and more minute spirals, which are only vaguely discernible under the microscope and in very favourable light. *Colour* whitish, hyaline. *Spire* conical. *Apex* bluntish, and a little obliquely rounded. *Whorls* $4\frac{1}{2}$, tumidly convex or rounded, of regular increase until the last, which is somewhat disproportionately swollen. *Suture* rather shallow and open. *Mouth* perpendicular, oval, rather large. *Outer lip* sharp and thin, with a slight sinus at its junction with the body; incurved above, slightly flattened in the middle, advancing below, patulous and longitudinally prominent, but slightly sinuated towards the point of the pillar. *Inner lip* just connected with the outer by a film across the body, closely and shortly bent back on the umbilicus, and sharp on the edge of the pillar. *Pillar* straight, angulately springing from the body-whorl, bending a little to the left. *Umbilicus* a minute chink, almost covered by the inner lip. H. 0.075. B. 0.048, least 0.04. Penultimate whorl 0.017. Mouth, length 0.037, breadth 0.028.

The general aspect of this shell resembles that of *Jeffreysia*, but the inner lip by no means presents so continuous a peristome as any of our British species of the genus, and the junction of the pillar to the body is quite distinctly angulated, which is not the case in any *Jeffreysia* known to me. If assigned to this genus, therefore, it is rather because none else lies nearer, and in the absence of the animal and of the operculum, a new genus would be absurd here.

CERITHIUM (*Adanson*), *Brug*.

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| 1. <i>C. (Triforis) levukense</i> , n. sp. | 12. <i>C. (B.) luscinae</i> , n. sp. |
| 2. <i>C. (T.) bigemma</i> , n. sp. | 13. <i>C. (B.) philomelae</i> , n. sp. |
| 3. <i>C. (T.) hebes</i> , n. sp. | 14. <i>C. (B.) gemmatum</i> , n. sp. |
| 4. <i>C. (T.) inflatum</i> , n. sp. | 15. <i>C. (B.) pupiforme</i> , n. sp. |
| 5. <i>C. matukense</i> , n. sp. | 16. <i>C. (B.) enode</i> , n. sp. |
| 6. <i>C. phoxum</i> , n. sp. | 17. <i>C. (B.) oosimense</i> , n. sp. |
| 7. <i>C. (Bittium) lissum</i> , n. sp. | 18. <i>C. (B.) cylindricum</i> , n. sp. |
| 8. <i>C. (B.) amblyterum</i> , n. sp. | 19. <i>C. (B.) abruptum</i> , n. sp. |
| 9. <i>C. (B.) mamillanum</i> , n. sp. | 20. <i>C. (B.) delicatum</i> , n. sp. |
| 10. <i>C. (B.) amboynense</i> , n. sp. | 21. <i>C. (B.) aëdonium</i> , n. sp. |
| 11. <i>C. (B.) pigrum</i> , n. sp. | |

1. *CERITHIUM* (*TRIFORIS*) *LEVUKENSE*, n. sp.

July 29, 1874. Levuka, Fiji. 12 fms.

Shell.—Sinistral, sharply conical, with a narrow and produced base, solid, yellowish white, glossy. *Sculpture*. Longitudinals—there are (on the last whorl) about twenty longitudinal rows of round tubercles, which rows form a small rib across the whorl, and are more or less continuous up the spire; these continue on the base as strongly as on the upper part of the whorls. These rows are parted by shallow rounded depressions. Spirals—the longitudinal rows are cut by narrow little rounded grooves, whose intersection with them forms the tubercles. On the upper whorls there is only one such spiral groove, so that there are only two tubercled spirals, but the groove gradually widens, and there appears in the bottom of it a minute additional spiral, which finally becomes as large as the other two; on the base are 3 equally divided tubercled spiral threads, of which the inmost is the smallest, and it ceases at the siphonal tube. The *apex* consists of 6 small rather elongated narrow whorls, of which the first $1\frac{1}{2}$ have about ten rows of minute tubercles faintly connected by spirals; the next $4\frac{1}{2}$ whorls are crossed by about 24 longitudinal sharp little ribs, rising into points at the carina, which is a continuous spiral thread. This carina on the first of these whorls is near the base, but later it rises so as to encircle the upper part of the whorl. The minute spiral rows of tubercles, which alone appear on the first whorl and half, cover the whole surface (both ribs and interstices) on the later apical whorls. The regular sculpture does not begin abruptly and at once, but a tongue of this new sculpture breaks across the top of the whorl, while the lower part retains the earlier ornamentation. *Colour*. The apical whorls are amber, the rest of the shell yellowish white, with a narrow amber-coloured thread within the contraction of the base of each whorl; this spiral thread is not continuous, being interrupted by each of the longitudinal rows of tubercles. *Spire* high, sharply conical, with a very slight convexity in its lines of profile, which are not perfectly alike. *Apex* a narrow and perfect cone, ending in a small rounded point. *Whorls* 17, of very regular increase, flat on the side; the whole last whorl is contracted and a little elongated; the base is narrow and flat. *Suture* sharply impressed, and broader than the spiral grooves, being margined on its upperside by a minute flat surface, which runs round the base of the superior whorl. *Mouth* almost more than perpendicular, square, with a largish auricle at



its upper corner, and a small and very transverse rift at the pillar. *Outer lip* sharp, thin, straight, perpendicular, angulated at the basal corner, flat across the base, turned in towards the mouth and pinched in at the pillar, where it joins the pillar-lip, closing in the side of the small siphonal canal, whose edge is sharp and straight, or a very little contracted all round. *Pillar* straight in front, then very much bent back, so that its posterior line almost stands on the edge of the base. *Pillar-lip* expanded but abruptly defined on the base, blunt but projecting on the pillar, where it is covered by and cemented to the outer lip. H. 0·22. B. 0·07, least 0·06. Penultimate whorl 0·032. Mouth, length 0·037, breadth 0·035.

This beautiful little species is very like in general aspect to *C. perversum*, L. ; but, apart from other obvious differences, the sculpture of the apex is quite distinct. In that species the extreme apex has about seven spiral scratches, parted by roughened threads, and the following whorls are beset with much closer-set and more numerous riblets, and they have two close-set spirals at the carina. The whole of this sculptured apex (in *C. perversum*) is stumpier, and the whorls are not so angulated, and the extreme point is blunter.

T. Hindsii, Desh. (Bourbon Moll. p. 99), is very near, but is less contracted in front towards the base, has not there near the mouth four rows of pearls, has the pearls white on a brown ground, has not the single amber thread, and is a little narrower in proportion.

2. CERITHIUM (TRIFORIS) BIGEMMA, n. sp.

St. 24. Mar. 25, 1873. Lat. 18° 38' 30" N., long. 65° 5' 30" W. St. Thomas, N. of Culebra Island, Danish West Indies. 390 fms. Coral-mud.

Shell.—Sharply conical, high and narrow, solid, opaque, brilliant, yellowish white. *Sculpture*. Longitudinals—the whorls are crossed by rows of tubercles with broad and rounded hollows between; of these longitudinal rows there are 17 to 18 on the last, and about 14 on a great many of the preceding whorls; besides these the surface is sharply, distinctly, and pretty closely scored by minute lines of growth. Spirals—a prominent spiral band encircles the whorls formed by two rows of rounded tubercles, which in each row are connected by a spiral thread; of these threads the lower is rather the larger, sharper, and more prominent. The distance between these threads is very nearly

the same as that between the longitudinal rows, so that each group of four adjoining tubercles forms nearly a rhomb. Round the upper part of each whorl is an impressed flat surface, in which, very near the suture, lies another smaller spiral, which becomes minutely tubercled where it crosses the longitudinal rows. At the bottom of each whorl is a very minute spiral thread, which forms a pouting edge to the suture. Besides these the surface is faintly reticulated by microscopic spirals crossing the longitudinal lines of growth. This reticulation is best seen on the flat and glossy base, which is unbroken except by a small sharp spiral, about 0.012 in. within the edge. *Colour* yellowish white, pure white on the upper part of the spire; round the base of each whorl is a suffused pale tint of brown, which is more or less the colour of the base of the shell; the point of the pillar is white. *Spire* high, narrow, and conical, slightly slewed to the left; so that while the left slope is straight, almost concave, the right slope is just perceptibly convex. *Whorls* probably 22, but of these the 3 or 4 apical ones are broken off; they are of very slow increase, flat, constricted on their upper part, flatly prominent in the middle, and contracted at the lower part; the base of the shell is flatly conical. *Suture* strongly defined by the depression in which it lies, but itself linear and projecting, being minutely marginated both above and below. *Mouth* squarely oval, pointed above and at the front of the pillar by the canal, which is small. *Outer lip* broken. *Pillar* short, small, straight, scarcely excavated or twisted, at the point sharp and slightly advancing outwards. *Inner lip*. A very thin layer of glaze is carried across the body, and turns round the pillar in a few microscopic lines, by which alone it can be traced. H. 0.6. B. 0.12. Penultimate whorl 0.072. Mouth, length 0.08, breadth 0.06.

This has a good deal the proportions of *C. metula*, Lov., with a narrower base. It slightly resembles the *Triforis Pfeifferi*, Crosse, and (apparently, for the B. M. tablet has more than one species on it) the *T. scitula*, A. Ad., both from S. Australia; but these have only one series of gemmules, the upper row being very much smaller, and in both the whole shell is very much smaller and slenderer. *T. gigas*, Hinds, is a much thinner and less strongly tubercled and sutured shell. *T. angustissima*, Desh. (Moll. de Bourbon), is larger, broader in proportion, has the lower (in his description "supérieure," as he reverses the shell) row of tubercles larger, and lacks the infrasutural flat constriction with its small and finely tubercled spiral.

3. CERITHIUM (TRIFORIS) HEBES, n. sp.

St. 135. Oct. 18, 1873. Nightingale Island, Tristão da Cunha Islands, S. Atlantic. 100–150 fms. Rock; shells.

Shell.—Cylindrically conical, blunt, uncontracted towards the base, strong, translucent, hardly glossy. *Sculpture*. Longitudinals—on the last whorl there are about 20 longitudinal rows of rounded tubercles, parted by depressions of much the same breadth and form as themselves; they run more or less continuously and straight up the spire from whorl to whorl. There are indistinct lines of growth. Spirals—on each whorl the tubercles are arranged in three spiral rows, parted by rather deep but narrow squarish furrows. The highest row is rather smaller and less prominent than the others. The base of each whorl is sharply but not deeply constricted; the edge of this constriction appears on the margin of the base as a rounded thread, defined by a slight furrow, which, with the exception of microscopic radiating lines of growth, is the only ornament of the flat and very slightly conical base. *Colour* pure somewhat translucent white. *Spire* high and conical, but contracting very little, and hence more cylindrical than usual. *Apex* very blunt, but almost mucronated; this arises from the three embryonic whorls, which are smooth, being formed of two tumid threads, of which the lower is the larger, but the upper is at first the more prominent, and at its origin stands up minute, round, and prominent, like a small eccentric blunt spike, reminding one of the mucronated mamillary plug of some of the *Cæcums*. It is not a plug, however, but the true embryonic form. This embryonic shell is smooth and glossy, but has some faint trace of spiral sculpture. *Whorls* 12, of very gradual increase, flat on the sides, constricted below, flat and hardly conical on the base. *Suture* well defined by the contraction of the whorl above it, and by a minute thread on which it projects. *Mouth* angulately oval, with a small straight canal in front. *Outer lip* broken. *Pillar* perpendicular, straight, short, narrow, pointed. *Inner lip* a thickish porcellaneous glaze. H. 0·24. B. 0·06. Penultimate whorl 0·03. Mouth, length 0·032, breadth 0·02.

This species has some resemblance to *T. suturalis*, Ad. & Rve., but is easily distinguished from that by its blunt apex and the less sunken suture.

4. CERITHIUM (TRIFORIS) INFLATUM, n. sp.

St. 24. Mar. 25, 1873. Lat. 18° 38' 30" N., long. 65° 5' 30" W.

St. Thomas, N. of Culebra Island, Danish West Indies. 390 fms. Mud.

Shell.—Small, narrow, conical, with a blunt inflated apex, solid, opaque, glossy. *Sculpture*. Longitudinals—there are on the last whorl 16 rows of small rounded but not blunt tubercles, which more or less continuously run obliquely down the spire in lines from right to left; the hollows which part them are in form much like themselves; there are also faint microscopic scratches on the lines of growth. Spirals—on each whorl the tubercles are arranged in two spiral rows, in which the tubercles have their sharp tips tilted up the spire, and they are parted by a triangular-shaped furrow, narrower than the spirals of tubercles. Below the under row of tubercles is a broader furrow, in the bottom of which runs the suture on the spireward face of a fine rounded thread occupying the extreme upper edge of the subjacent whorl. This thread is undulated rather than tubercled where it crosses the longitudinal rows; on the spireward side this thread is defined by a minute deep square-bottomed trench, while on the basal side it lies close in to the foot of the upper spiral row of tubercles. Round the edge of the base is a slight sharp narrow keel, which the succeeding whorl as it grows buries in the spiral thread mentioned above. At 0·004 from the edge, and there forming a ledge, the whole centre of the base is slightly projected: with this exception, the flat and scarcely conical base has no ornamentation beyond the radiating lines of growth and the microscopic spirals, which, though visible on the rest of the shell, are, as usual, more distinct on the base. *Colour* dull translucent white. *Spire* high, narrow, and conical. *Apex* blunt and inflated. The two embryonic whorls are larger, but otherwise very much like those of *C. metula*, Lov., being turban-shaped and projecting beyond the succeeding whorls; they are glossy and quite smooth but for some very faint microscopic longitudinal and spiral lines. *Whorls* 13, of very gradual increase, flat on the sides; the base, too, is flat, and very little conical. *Suture* linear, almost hidden by the overlap of the subjacent whorl. *Mouth* very small and square, with a minute, round, very short canal in front, whose edges are reverted all round. *Outer lip* broken. *Pillar* very small, extremely short, straight, but reverted at the point. *Inner lip* not fully formed. H. 0·2. B. 0·06. Penultimate whorl 0·02. Mouth, length 0·028, breadth 0·025.

This species, which in shape resembles *T. suturalis*, Ad. & Rve., may be easily distinguished from that species by the absence of

the deep suture and by the inflated apex. From *C. (T.) hebes*, W., its sculpture and its apex distinguish it at once.

5. *CERITHIUM MATUKENSE*, n. sp.

St. 173. July 24, 1874. Lat. $19^{\circ} 9' 32''$ – $35''$ S., long. $179^{\circ} 41' 50''$ – $55''$ E. 310–315 fms. Coral.

Shell.—A tall, narrow, sharply-pointed cone, somewhat tumid in the last whorl, with little sculpture, but with largish white varices, and beautiful glossy brown spiral threads, speckled with white on a dull translucent white ground. *Sculpture*. Longitudinals—the upper whorls are thickly set with narrow, close, curved, tubercled ribs, which run with a slight twist almost continuously from whorl to whorl; irregularly, but on nearly each whorl, one of these ribs swells and broadens as a white varix. On the later whorls the ribs are much less marked and the tubercles crowd closely together on the spiral threads; the varices, too, become larger, and appear at the distance of $1\frac{1}{2}$ whorl; the surface is also thickly set with fine sharpish hair-like lines of growth. Spirals—Besides one in the suture concealed by the succeeding whorl, there are on the small apical whorls 3, but on the last 13 or 14 whorls there are 4 narrow well-defined rounded glossy spiral threads; on the last whorl, in its latter half, one or two more narrower threads appear on the upperside of the whorl; on the base they are narrower and set more closely, and four or five delicate ones ornament the pillar. On the last whorl especially the upper spirals are studded with close-set small round tubercles. The interstices are about three times as broad as the threads themselves, and are delicately fretted with very fine spiral lines. *Colour* a translucent white, dead towards the apex, with some irregular brownish stains on the spire, dead-white varices, and brilliant brown spiral threads spotted with white tubercles. *Spire* tall, conical, and a little bent. *Apex* sharp but rounded. *Whorls* 20, of very slow and regular increase, scarcely convex, but the last is a little tumid, flattened on the base, but not at all angulated, and bisected by an exceptionally large varix. *Suture* linear, but with a very slight impression. *Mouth* nearly semicircular, from the great sweep of the outer lip, and the very slight relative concavity of the whole inner lip from the upper corner of the mouth to the point of the pillar; porcellanous within. At its upper angle there is a narrow little corner formed by a slight contraction of the lip towards the body, and by the elevation of the second basal thread into a tooth by a porcellanous thickening at this

point. *Outer lip* ascends slightly on the body-whorl, towards which at the same time it is a very little pinched in. From this point to the edge of the canal it forms a very equable curve; slightly retreating at first so as almost to form a shallow open sinus, it is thrown out into a wing-like projecting expansion in the middle. It is patulous, reverted, thin on the edge, but thickened within by a glossy porcellanous callus, stained dark brown at the ends of the spiral threads. The short anterior canal bends over towards the pillar, is well defined, round, with the oral lips a little contracted and its front margin a good deal reverted. The *pillar* is short, straight, narrow, at the point sharp and bent to the left, with a narrow and twisted edge; in colour porcellanous white. *Inner lip* is glossy, rising into a tooth on the first intraoral thread, spread out on the body, with a slightly thickened and well-defined edge on the pillar. H. 1·6. B. 0·47, least 0·34. Penultimate whorl 0·23. Mouth, length 0·32, breadth 0·27.

This species in form and colour is not unlike *Cerithium longicaudatum*, Ad. & Rve., or *C. attenuatum*, Phil., but in details of whorls and of sculpture it is totally different.

6. CERITHIUM PHOXUM, n. sp. (*φοξός*, tapering.)

July 29, 1874. Levuka, Fiji. 12 fms.

Shell.—Sharply conical, on the base contracted and a little obliquely flattened, longitudinally ribbed with spiral tubercled threads, of a certain waxy whiteness tinged with yellow and ruddy brown. *Sculpture*. Longitudinals—there are from ten to eleven straight but oblique riblets on each whorl; on the earlier whorls they are pretty continuous, with a sinistral twist round the spire, but on the later whorls they become less regular. Besides these there are fine scratch-like lines of growth. Spirals—on the upper whorls there are four, on the later five, which, as they cross the riblets, rise into tubercles. They are parted by intervals of two to three times their width, and in these intervals two or three narrower but similar threads appear, as they do also on the base, where there are two stronger circumbasal threads and a multitude of finer hair-like spirals, which extend to the point of the pillar. Besides these the whole surface is covered with finely fretted microscopic spirals. *Colour* a delicate waxy straw-colour, with stains of a brownish flesh tinge. *Spire* very slightly scalar, straight, and very sharply conical. *Apex* fine. *Whorls* 14,

of slow increase and straight outline, with about one varix on each. *Suture* a very little impressed at the base of each whorl. *Mouth* oval, with a sharp angulation at the canal and at the upper corner, where the lip is sinuated and pinched in against the body-whorl, and where the corner is further narrowed into a little canal by the strong tooth which rises nearly on the interior basal thread. *Outer lip* sharp, fluted on the edge, thickened by an external varix; ascending a little at its junction with the body-whorl, it retreats so as to form a slight sinus; it sweeps round with a very equable curve, advancing about the middle into a patulous wing-like projection; across the base it is flat, advancing, but scarcely patulous. The anterior canal is rather narrow and deep, short, bent back, and with its front margin reverted all round except on the pillar. *Pillar* short, angulated, and slightly twisted in front where it bends to the left, sharp-pointed. *Inner lip* thickened, and forming a ledge along its whole length. H. 0·8. B. 0·27, least 0·22. Penultimate whorl 0·12. Mouth, length 0·2, breadth 0·17.

7. CERITHIUM (BITTIUM) LISSUM, n. sp. (*λίσσός*, smooth.)

July 29, 1874. Levuka, Fiji. 12 fms.

Shell.—Conical, rather stumpy, a little contracted and drawn out on the base, longitudinally ribbed, smoothed, of a brownish-white colour. *Sculpture*. Longitudinals—towards the apex there are on each whorl about twelve small, rounded, rather hunchy, straight and regular ribs, parted by hollows broader than the ribs; these very soon become less regular, and, though larger, are less so relatively to the size of the whorls and to the breadth of the hollows between them. On the penultimate whorl they become nodose, especially on the lower part of the whorl, and on the last whorl they are almost entirely replaced by unconnected rows of tubercles. The surface is very faintly scratched with lines of growth. In the middle of the last whorl there is a pretty strong white varix, broad above and projecting below. Spirals—there are many (on penultimate whorl about 20) irregular, unequal and unequally-parted scratches, three or four of which are markedly larger than the rest. Raised between these lie minute hair-like lines, with here and there a flat thread, which, in crossing the ribs, rise, at the top and especially near the bottom of the whorls, into rounded tubercles. On the last whorl there are four rows of these tubercles—one just below the suture, where they are

broad and flat; the second small and indefinite; the third at the periphery, where, transversely long, the tubercles are sharp and small; the fourth row is within the base, and there they are very small. The pillar is feebly scored with many remote very small threads. The surface is otherwise smooth and rather glossy. *Colour* dead white, with minute longitudinal lines and spots of faint ruddy brown, with suffused stains of fainter brown; on the penultimate whorl there are five, on the last ten very fine spiral lines of the same colour. *Spire* sharply but slightly convexly and a very little gibbously conical. *Apex* sharp. *Whorls* about 14, of regular increase, flat; the last is contracted and drawn out and slightly bent from the axis of the shell, while the base is a little pinched in. *Suture* very faint. *Mouth* oval, but pointed at the canal and at the upper corner, where it is narrowed by a slight contraction of the lip and by the basal tooth; porcellaneous and glossy within. *Outer lip* ascends markedly on the body-whorl, sinuated, contracted, and a little turned in above, expanded, patulous, and wing-shaped in the middle, flat and slightly turned in on the base. It is on the edge rounded, thin, irregularly channelled, with an external, narrow, projecting varix. The canal is longish, narrow, and very much cut off obliquely backwards. *Pillar* is short and narrow though strong, but rises from an elongated base; it bends to the left, and has a long fine edge on the margin of the canal. *Inner lip*. Above and at the basal tooth it is thick and abrupt on the edge, but below this thin though defined; it is somewhat thicker along the canal. H. 1. B. 0·36, least 0·29. Penultimate whorl 0·17. Mouth, length 0·28, breadth 0·19.

8. CERITHIUM (BITTIUM) AMBLYTERUM, n. sp. (ἀμβλύτερος, rather blunt.)

St. 75. July 2, 1873. Lat. 38° 38' N., long. 28° 28' 30" W. Fayal, Azores. 500 fms. Sand.

Shell.—In general aspect very much like *C. metula*, Lov., but narrower, and having a sharper apex, and in texture and ornamentation recalling an *Odostomia* of the *Chemnitzia* group. *Sculpture*. Longitudinals—there are on the last whorl twenty-one small longitudinal ribs, which run more or less continuously straight up the spire; they are curved so as to be posteriorly convex, and each bears two tubercles—one, the smaller, near the top, the other near the bottom of the whorl; their interstices are shallow, flat, and narrow. There are, besides these, faint lines

of growth, which, on the base, are curvedly radiating and strong. Spirals—there is a spiral thread near the top of each whorl, connecting the upper series of tubercles, and the adjacent tubercles at the lower ends of the ribs are confluent, forming a continuous spiral; round the edge of the base is a fine round carinal thread; of microscopic spirals there seems to be no trace. *Colour* translucent white. *Spire* high, narrow, and conical. *Apex* small, glossy, roundly pointed and oblique, the extreme point rising slightly on one side. The embryonic whorls are two, slightly oblique, convex and perfectly smooth, but for some very faint spiral scratches. After these faint and sparse riblets begin to appear, and only after two more whorls do these reach distinctness. The second, though narrower, is higher than the third. *Whorls* 12, of very gradual increase, flat on the sides, slightly carinated by the projection of the lower thread of tubercles, a little contracted into the suture, on the base scarcely convex but conical. *Suture* linear and very minute. *Mouth* squarish, with a largish oblique opening into the canal, which is semicircular, a little oblique, and with very shortly reverted edge. *Outer lip* thin, straight, but strongly angled at the corner of the base. *Pillar* very short, perpendicular, rather broad, rather sharp-edged at the point, where it is obliquely truncate and tilted to one side. *Inner lip* a very thin layer of glaze. H. 0.25. B. 0.065. Penultimate whorl 0.03. Mouth, length 0.033, breadth 0.027.

While the general form of this species resembles *C. metula*, Lov., the sculpture is very distinct, and the apex, though blunt, is much finer and sharper, and not inflated as in that species.

9. CERITHIUM (BITTIUM) MAMILLANUM, n. sp.

St. 120. Sept. 9, 1873. Lat. $8^{\circ} 37'$ S., long. $34^{\circ} 28'$ W. Per-nambuco. 675 fms. Mud.

Shell.—In general aspect very much like *C. metula*, Lov., but narrower, and having a still blunter and more swollen apex. *Sculpture*. Longitudinals—on the last whorl there are twenty-one small, narrow, longitudinal ribs, which are curved so as to be posteriorly convex; they appear faintly on the outer circumference of the base; the line of these from whorl to whorl runs very straight up the spire. The whorls are also microscopically striate in the lines of growth. Spirals—near the suture a spiral thread encircles the top of the whorls, and rises into minute tubercles where it crosses the ribs; near the foot of the whorls is a strong

carination, and here each longitudinal rib projects strongly into a rounded, narrow, longitudinal tubercle; the base is encircled by a small sharp thread, which is undulated but not tubercled by the longitudinal ribs. *Colour* translucent white, more ivory than porcellaneous. *Spire* high, narrow, and conical. *Apex* blunt, inflated, and projecting beyond the contour-lines of the spire, as if the two embryonic whorls had been squeezed down and spread out in the operation. They are glossy and quite smooth, but with a trace of spiral arrangement in the microscopic texture. Faint traces of the longitudinal ribs appear toward the end of the second whorl, and the spiral threads appear pretty strongly on the third. *Whorls* 12, of very gradual increase, slightly concave on the sides, and below the carina sharply contracted in toward the suture. *Suture* well marked by the contraction of the whorl above it and the slight angular prominence of the whorl below it. *Mouth* square and small. *Pillar* very short, perpendicular, broad, with a small, blunt, oblique but not reverted point. *Inner lip* a very thin layer of glaze. H. 0.22. B. 0.06. Penultimate whorl 0.025. Mouth, length 0.03, breadth 0.025.

The sculpture in this species resembles a good deal *C. amblyterum*, W., as they both do *C. metula*, Lov.; but the details of the sculpture are quite different, and the peculiar form of the apex distinguishes it easily from both. The only specimen of this shell was unfortunately broken before it was figured.

10. CERITHIUM (BITTIUM) AMBOYNENSE, n. sp.

October 6, 1874. Amboyna. 15–20 fms.

Shell.—Small, narrow, conical, with convex outline, a narrow, contracted and bluntly conical base, solid, opaque, dull, light brown. *Sculpture*. Longitudinals—there are on the last whorl about 20 broad, shallow depressions, parted by longitudinal rows of small tubercles, which, toward the mouth, tend to crowd out the depressions. These rows preserve no relation to each other in adjoining whorls. There is about the middle of the whorl a broad, feeble varix, which includes several of these rows of tubercles; there are besides many irregular lines of growth. Spirals—there are on the last three whorls four, and on all the preceding whorls three spiral threads, which are beset with small, low, round tubercles, which become smaller toward the mouth. Above the suture another very small spiral appears; it lies just within the contraction of the base, and has no tubercles. Within this,

on the base and close to it, is another and stronger spiral. A broad, shallow, but well-defined furrow lies within this, having a minute spiral in the bottom of it. The pillar rises within this furrow, encircled by a rather strongish spiral thread, and three more finer spirals twine round it. Only on the base is there the faintest trace of most minute microscopic spirals. *Colour* pale yellowish brown, quite uniform throughout. *Spire* high and narrow, with convex contour-lines, which are strongly impressed at the suture. In the upper part of the spire the whorls are a little scalar. *Apex* broken. *Whorls* 9, flat, of very gradual increase. *Suture* impressed. *Mouth* square. *Outer lip* broken. *Pillar* straight, short, and broad. *Inner lip* formed by a thick layer of glaze, which presents a narrow edge on the pillar. H. 0.14. B. 0.05. Penultimate whorl 0.025. Mouth, length 0.03, breadth 0.02.

This species very much resembles *C. reticulatum*, Da Cos., but there is appreciable difference in its contour-lines, which are much more curved, and the upper whorls are scalar, while in the young of that species, with the same number of whorls, the contour-lines are straight and the outline perfectly conical. In this, too, the base is more contracted and hollower than in that. The apex is unfortunately broken; but the basal part of the embryonic shell is broader, less oblique, and has not the characteristic fine spiral threads which encircle the base of the second and third whorls in that species.

11. CERITHIUM (BITTIUM) PIGRUM, n. sp.

St. 135. October 18, 1873. Nightingale Island, Tristão da Cunha Islands. 100–150 fms.

Shell.—Tall, narrow, conical, with convex outlines, blunt, flat on the base, strong, opaque white. *Sculpture*. Longitudinals—there are on the last whorl twenty-one flattish, rounded, narrow ribs, parted by depressions of about the same form and size; the surface is also very faintly microscopically striate. Spirals—on all the whorls, except the first two, there are three fine narrow spiral threads, which rise into feeble tubercles where they cross the longitudinals. The first and second are a little closer together than the second and third, which are separated by a flat space of about twice the breadth of the spirals. Below the lowest spiral there is a rather abruptly sloping but broadish contraction into the suture, close above which lies a plain, narrow, spiral thread, which on the last whorl forms the edge of the base, and is there

defined by an inferior minute spiral furrow. With the exception of this and of very faint microscopic spirals and lines of growth, the base is quite plain. *Colour* dead white. *Spire* high and narrow, with slightly convex outlines; the lowest tubercled spiral on each whorl slightly projects beyond the top of the whorl which follows. *Apex* blunt and smooth. *Whorls* 13, flat on the sides, narrowed upwards, constricted at the bottom above the suture. *Suture* minute, but well defined by the furrow and by the thread which lies in the bottom of it above the suture. *Mouth* square. *Outer lip* broken. *Pillar* short but rather narrow. *Inner lip* incomplete. H. 0.36. B. 0.095. Penultimate whorl 0.04. Mouth, length 0.08, breadth 0.05.

This, as regards its sculpture, also belongs to the *C. reticulatum* group.

12. CERITHIUM (BITTIUM) LUSCINIÆ, n. sp.

St. 135. October 18, 1873. Nightingale Island, Tristão da Cunha Islands. 100–150 fms.

Shell.—Small, narrow, conical, blunt, with straight outlines, rounded but not contracted at the base, solid, translucent, glossy, white. *Sculpture*. Longitudinals—there are 17–18 longitudinal rows of coarse, flat, rounded tubercles, parted by furrows narrow and shallow; these lines run very straight up the spire. Spirals—on all but the first three whorls there are three equally-parted spiral threads, which rise into tubercles in crossing the longitudinals; of these three spirals the highest is the smallest and least prominent. The first whorl is smooth and glossy, with a few irregular wrinkles; the second is regularly and curvedly ribbed and furrowed longitudinally; on the third the general sculpture of the shell begins, but the highest spiral is absent, only its place is indicated by a broader infrasutural depression. The base has round its margin a sharp-edged thread, and close within this a very faint furrow. *Colour* translucent glossy white. *Spire* is high, narrow, and has straight outlines. The base of each whorl projects slightly beyond the top of that which succeeds it, and the suture is sunk in a well-marked furrow. *Apex* is abrupt and rounded, but the extreme point is obliquely prominent. *Whorls* 9, flat on the sides, narrowed upwards, and constricted at the bottom above the suture. *Suture* linear and very minute, but well marked by the furrow which lies above it. *Mouth* squarish. *Outer lip* incomplete. *Pillar* straight, short,

and strong. *Inner lip* unformed. H. 0·147. B. 0·06. Penultimate whorl 0·02. Mouth, length 0·03, breadth 0·028.

The sculpture of this species is after the fashion of the *C. reticulatum*, Da Costa, group, but the form of the shell, its details of sculpture, and the shape of the apex are very distinct. It is not quite full-grown, so that the form of the base is not entirely developed.

13. CERITHIUM (BITTIUM) PHILOMELÆ, n. sp.

St. 135. October 18, 1873. Nightingale Island, Tristão da Cunha Islands. 100–150 fms.

Shell.—Small, narrow, conical, blunt, outlines scarcely convex, rounded at the periphery into the blunt square base, solid, dead white, not glossy. *Sculpture*. Longitudinals—on the last whorl there are 21 rows of rather coarse round tubercles, parted by very narrow furrows; these lines run very straight up the spire. Spirals—on all but the first two whorls there are three very equal spiral threads, which rise into tubercles as they cross the longitudinals; these threads do not appear on the first two whorls; they are parted by shallow furrows. The base of the whorls is sharply but shallowly contracted, and in the bottom of the contraction, above the suture, lies a small spiral, which is undulated in crossing the longitudinals, and which, on the base, forms a weak, feebly-tubercled circumferential border. *Spire* is high, narrow, and has its outlines barely curved. *Apex* is blunt and rounded, with a very minute oblique projection. *Whorls* 8, just barely convex on the sides. *Suture* very minute and linear, but well marked by the furrow at the base of the whorls. *Mouth* squarish. *Outer lip* broken. *Pillar* straight, short, and broad. *Inner lip* a layer of glaze crossing the body and twining round the pillar. H. 0·128. B. 0·05. Penultimate whorl 0·025. Mouth, length 0·03, breadth 0·02.

This species, in its sculpture, belongs to the *C. reticulatum* group. Than *C. lusciniæ*, which it resembles, it is much smaller, more delicate in sculpture; the apex is less squeezed down than in that species.

14. CERITHIUM (BITTIUM) GEMMATUM, n. sp.

St. II. Jan. 13, 1873. Lat. 38° 10' N., long. 9° 14' W. Setubal. 470 fms. *Globigerina*-ooze.

Shell.—High, conical, not narrow for the genus, blunt, with

straight outlines, distinct suture, rounded base, tubercled, thin, translucent white. *Sculpture*. Longitudinals—the whorls are crossed by oblique, curved, and tubercled ribs, of which there are on the last whorl 17, on the preceding 14, and they diminish rapidly in number. They are quite obsolete near the mouth, and die out on the base; they are parted by open longitudinal furrows fully wider than themselves. The furrows and ribs run down the spire from whorl to whorl without a twist, but with a strong dextral obliquity. There are a very great many fine irregular and unequal lines of growth. Spirals—each whorl is carinated by two strongish rounded spiral threads, which rise into largish tubercles on the longitudinal ribs; the upper is rather the stronger and more prominent; near the mouth they both become feebler: the tubercles on the upper thread are smaller, while on the lower they disappear. These spirals are parted by a flat shallow furrow about twice as wide as themselves. Below the under spiral the whorls contract into the suture, above which is a very narrow flat thread, which on the base forms the strongish marginal border. Above the upper spiral the whorls also contract, and immediately below the suture there is a very small and feebly tubercled spiral. On the base, within the marginal thread, is another. The centre of the base is plain and a little impressed; round the base of the pillar are two fine threads, while a third, very minute, twists up the pillar. The whole surface is fretted with minute microscopic spiral scratches. *Colour* translucent white. *Spire* is high, and has straight outlines. *Apex*, which is blunt and perfectly rounded and glossy, has two whorls. *Whorls* 12, of regular increase, convex, being constricted above and below. *Suture* linear, but well marked. *Mouth* oval, scarcely pointed above, and with an open shallow canal in front, resembling that in *C. reticulatum*. *Outer lip* very thin, very slightly ascending where it joins the body, forming an equable, nearly semicircular curve to the edge of the canal. *Pillar* very short and little projecting, with a distinct twist; at the point small, rounded, and narrow-edged. *Inner lip* forming a continuous curve across the body and up the pillar; on the body it is a thin glaze, but its edge on the pillar is thicker and more defined. Height 0·31. B. 0·09. Penultimate whorl, height 0·04. Mouth, length 0·066, breadth 0·05.

15. CERITHIUM (BITTIUM) PUPIFORME, n. sp.

St. 186. Sept. 8, 1874. Lat. 10° 30' S., long. 142° 18' E.
Wednesday Island, Cape York. Coral-sand. 8 fms.

Shell.—Small, narrow, conical, blunt, with convex outlines, contracted both toward the apex and the point of the base, reticulated, tubercled, solid, translucent, glossy, white. *Sculpture*. Longitudinals—there are on the last whorl about 25 rows of small, rounded, adjacent tubercles; they are parted by mere lines, and run pretty straight, but with a slight sinistral turn down the spire. On the upper part of the spire the rows are straight, but in the penultimate whorl, where the shell begins to contract toward the base, the rows have a slight concave and dextral curve. Spirals—on each whorl there are three equal spiral threads, which form the tubercles as they cross the longitudinal rows; they are parted by two narrow and shallow furrows; there is a strong deep sutural furrow. Besides these there are quite inconspicuous microscopic longitudinal and spiral lines on the surface. The very narrow base is encircled by a strong rounded prominent thread, within which a deep furrow surrounds the pillar. *Colour* translucent white. *Spire* high and narrow, with convex outlines. *Apex* extremely abruptly truncate, rounded. The smooth embryonic shell consists of one and a half whorls, and the tip of it scarcely rises into sight. *Whorls* 9, contracted upwards, flat on the sides. The base is extremely contracted; and as the contraction begins in the penultimate whorl, the form of the shell resembles the pupa of an insect. *Suture* only defined by the deep furrow in which it lies. *Mouth* oval, with a very small channel in front. *Outer lip* broken. *Pillar* very short, strong, but not broad; the point is in the only specimen slightly broken. L. 0.1. B. 0.037. Penultimate whorl 0.02.

In general form, but in that alone, this is very like some of the ill-thriven looking forms of *Cerithiopsis minima*, Brusina, but is obviously very different.

16. CERITHIUM (BITTIUM) ENODE, n. sp.

St. 120. Sept. 9, 1873. Lat. 8° 37' S., long. 34° 18' W. Off Pernambuco. 675 fms. Mud.

Shell.—Small, narrow, conical, apex blunt and mammillated, outlines straight, square on the base, finely ribbed, but not reticulated nor tubercled, thin, white. *Sculpture*. Longitudinals—there are on each whorl about 26 small, narrow, sharp, curved distant ribs, which run continuously from whorl to whorl, and very straight down the spire. The ribs are about 0.001 in. wide, and the interstices five to six times as much; toward the apex they become

more crowded. In the interstices a feebler riblet is occasionally intercalated. They die out on the base with a strong, posteriorly convex curve. Spirals—near but not just at the suture the top of each whorl projects in a sharp minute carina, defined by a spiral thread, which forms a small knot in crossing each riblet; about one third down the whorl a very fine sharp thread runs round the shell, rising over, but scarcely forming knots on the riblets. Another one third down a very faint thread appears. The margin of the base is defined by a sharp, minute, knotted, carinal thread, the edge of which may just be traced at the bottom of each whorl, just above the suture, all the way up the spire. The base is plain but for a very faint submarginal thread. The apex is smooth and glossy, with nothing but microscopic evanescent superficial spirals. Over the whole surface of the shell there is a microscopic reticulation of faint, pretty equal, longitudinal and spiral scratches. *Colour* ivory-white. *Spire* high, narrow, with perfectly straight conical outlines. *Apex* truncate, and then finished with a slightly depressed mammillate, glossy, pure white tip, consisting of a whorl and a half, which is straight on the top and not oblique. *Whorls* 9, straight or just faintly concave on the side, slightly scalar as they rise out of one another. The base is not in the least contracted, and is barely convex. *Suture* only recognizable from the slight shoulder of the whorl below it. *Mouth* small, angularly oval, with a blunt and laterally directed point above, and an oblique canal in front, which, relatively to the size of the mouth itself, is very large. *Outer lip* very straight, being neither incurved nor patulous, except round the edge of the canal, where it is slightly so. *Pillar* very short and conical, with an abrupt little, broad, parallel-sided style, with a very oblique, fine, rounded edge, and ending in a fine point on the left. *Inner lip* a fine glaze on the body and edge of the pillar. H. 0.19. B. 0.06. Penultimate whorl, height 0.028. Mouth, length 0.039, breadth 0.028.

This is a peculiarly beautiful shell, and, like *C. mamillanum* from the same locality, departing widely in sculpture from the coarse type common to the genus. From that species it differs markedly in its being much stumpier in form and in the carina being placed at the top and not at the bottom of the whorls. From *C. amblyterum*, another deep-sea form, and which it also resembles slightly, it differs in being stumpier and in having a much blunter and shorter apex.

17. CERITHIUM (BITTIUM) OOSIMENSE, n. sp.

May 14, 1875. Oosima, Japan.

Shell.—Small, broadish, conical, pointed, whorls angulated, semi-imbricated, corrugated longitudinally, not reticulated, tubercled, variced, thin, brownish grey, with white and brown spots.

Sculpture. Longitudinals—there are on the penultimate whorl 13 depressed, rounded, slightly oblique ribs or corrugations, parted by furrows, shallow, rounded, and narrower than the ribs. These ribs diminish in number upwards on the spire, down which they run from whorl to whorl, with a slight oblique twist from left to right. On the last whorl one of these is strengthened into a feeble varix, but the rest become increasingly inconspicuous, and at last scarcely recognizable; on the base they are still traceable as faint corrugations. Spirals—each whorl, at about one fourth of its height from the suture, projects in an angular carination, which carries a small, but distinct rounded thread, rising into transverse tubercles where it crosses the longitudinal corrugations. Above this carinal thread there are four very small flat spiral threads, equal, and equally parted by three small furrows, in each of which lies a minute spiral thread. The furrow which separates the lowest of these four spirals from the carinal thread is plain, having no minute spiral in it. Below the carinal angulation the whorls are constricted. Within this constriction there are on each whorl two small alternating furrows and threads, then a comparatively broad and deep furrow, below which a small spiral thread lies immediately at the suture, but above it. It is this suprasutural thread which forms the edge of the base, and is there nearly as strong as the carinal thread. Its inner side is defined by a strongish furrow, within which the whole base to the point of the pillar is covered with small alternating threads and furrows, in number about 9, of which the first and the fifth thread are a little stronger than the rest. Besides these, the whole surface is microscopically covered with sharpish spirals and slight lines of growth. These last are very distinct toward the point of the pillar. *Colour* brownish grey, with porcellaneous white spots where the spirals cross the corrugations, and with a good deal of suffused ruddy brown, especially on the base and about the suture; the edge of the pillar is deeply tinged with this colour. *Spire* pointed, conical, with straight profile lines, angulated by the pagoda-like projections of the whorls at the carina, and their constrictions below this into the suture. *Apex* small and rounded.

Whorls 11, of very gradual and regular increase, straight on the side, contracted upwards into the suture, and overhung by the projection of the preceding whorl above. The base is conical and very slightly concave. *Suture* invisible, though the situation is strongly defined by the suprasutural furrows. *Mouth* rather large, oval, bluntly pointed at the upper outer corner, and with a small open canal beyond the point of the pillar. *Outer lip* thin, corrugated, slightly expanded above, extremely patulous and projecting on the whole base, slightly pinched in at the side of the canal, advancing markedly beyond the point of the pillar, with a patulous and very slightly reverted sharp edge round the canal. *Pillar* straight, prominent, rounded, not short, but not projecting so far as the outer lip; its edge is finely rounded, but not sharp; its point is cut off quite straight, transversely, and is rounded. *Inner lip* a thin glaze on the body, but with a distinct edge, which is slightly thickened toward the point of the pillar. H. 0·21. B. 0·084. Penultimate whorl, height 0·035. Mouth, length 0·06, breadth 0·047.

The peculiar semi-imbricated growth of the whorls in this species recalls somewhat the curious *C. dubium*, Sow.; but the species differ obviously in size, form, and sculpture.

18. *CERITHIUM (BITTIUM) CYLINDRICUM*, n. sp.

April 17–18, 1874. Port Jackson, Sydney. 2–10 fms.

Shell.—Small, high, narrow, pointed, cylindrically conical, reticulate, tubercled, strong, dark brown. *Sculpture*. Longitudinals—there are on the last whorl about 25 narrow, posteriorly convex, curved riblets, which cannot be followed from whorl to whorl down the spire, and which hardly appear on the base amidst the strong curved lines of growth found there. These riblets are parted by squarish furrows about as broad as themselves. Spirals—there are on each whorl three pretty equal, squarish, not much prominent, spiral threads, which become prominent themselves and give prominence to the longitudinals by expanding into round-topped tubercles as they cross the riblets; they are parted by furrows, which are of about the same breadth as themselves; the sutural furrow is slightly deeper and broader than the others. The edge of the base is squarish, and is defined by a narrow sharpish-edged spiral thread. The base, which is flatly conical, is plain but for the lines of growth; the pillar is defined by a minute, sharpish spiral thread, which runs round its base and meets the slit of the canal. Besides these the whole surface of

the shell is microscopically scored with irregular lines of growth and fine spiral scratches. *Colour* dark ruddy brown, uniform all over. *Spire* high, narrow, pointed, with straight but slightly angulated contour lines. The first eight whorls expanding regularly, so as to form a minute cone, while the last four expand more slowly, so as to give more of a cylindrical shape. *Apex* small, blunt, rounded, slightly oblique, and a little immersed. *Whorls* 13, flat, except the last, which is slightly convex, with a somewhat flat but conical base. *Suture* in the bottom of a deep furrow is concealed by a projection of the inferior whorl. *Mouth* oval, with a small rounded sinus at the upper outer corner, and a largish and deepish canal running in behind the pillar. *Outer lip* not expanded, deeply corrugated by the ends of the spirals, with a deep V-shaped fissure forming the canal. *Pillar* straight, not short, pretty strong, with a rounded, narrow, twisted edge, and a small but not sharp point, which is very slightly reverted. *Inner lip* little more than a film on the body and pillar. H. 0.27. B. 0.064. Penultimate whorl 0.031. Mouth, length 0.042, breadth 0.028.

19. CERITHIUM (BITTIUM) ABRUPTUM, n. sp.

St. 75. July 2, 1873. Lat. $38^{\circ} 38' N.$, long. $28^{\circ} 28' 30'' W.$ Fayal, Azores. 450–500 fms. Sand.

Shell.—Small, narrow, conical, blunt, in general form very like a decollated *Cerithiopsis metaxa*, solid, translucent, white. *Sculpture*. Longitudinals—there are on the last whorl about thirteen, on the earlier, fewer longitudinal ribs, which are low and narrow, and are parted by flat and broader furrows. They come down the spire, from whorl to whorl, with a strong sinistral twist. The embryonic whorls have ten or twelve small ribs. Spirals—except on the first two whorls there are on each whorl four narrow, rounded, prominent spiral threads, which rise, as they cross the longitudinals, into pointed high tubercles. The furrows which part them (except that between the third and the fourth) are narrower than the spirals. The highest of these spirals is the weakest and least prominent, being pinched in by the superior contraction of the whorl into the suture. Close above this highest spiral runs the suture. The base of each whorl is roundly but rather abruptly contracted, so that the sutural furrow has its upper-side abruptly, its underside gradually, declining. The base, which is oblique, concave, and contracted, has a strong plain spiral thread round its edge, and a very minute thread encircling the base of

the pillar, the scar of the siphonal cut. Besides the larger systems of sculpture, there are some faint and irregular traces of microscopic rounded longitudinals and sharper spirals. *Colour* translucent white. *Spire* high, narrow, with very straight outlines, and scarcely contracted. *Apex* excessively blunt and abrupt, the extreme point being rounded and barely rising into view; it is quite smooth and polished. The second whorl is longitudinally ribbed and polished; on the third the ordinary sculpture begins. *Whorls* 11, convex, constricted suddenly below and gradually above. *Suture* excessively minute and faint in itself, but its place strongly marked by the constriction of the whorls above and below. *Mouth* very small, oval, perpendicular, pointed above, and with a large open rounded slit in front, whose edge is hardly reverted. *Outer lip* thin, advancing on the base much beyond the point of the pillar. *Inner lip* a thin glaze, with microscopic corrugations on the pillar. *Pillar* very short, with a broad base spreading out to meet the outer lip, straight, with a broad but sharp point. H. 0.23. B. 0.05. Penultimate whorl, height 0.03. Mouth, length 0.028, breadth 0.02.

This species in general aspect is very like *Cerithiopsis metaxa*, della Chiaje, but differs in not having the sharp sculptured apex; the whorls, in consequence of the sutural contraction, are more rounded; the longitudinals are swellings of the whole shell, not, as in that other, mere projecting tubercles; the spirals are more definitely continuous; the longitudinal rows of tubercles run less definitely from whorl to whorl, and have a strong sinistral twist as they proceed down the spire, while in *C. metaxa* their continuous lines are very straight.

20. CERITHIUM (BITTIUM) DELICATUM, n. sp.

St. 135. Oct. 18, 1873. Nightingale Island. Tristão da Cunha Islands. 100–150 fms.

Shell.—Small, narrow, conical, blunt, with slightly convex outlines, rather tumid on the base, ribbed, but not reticulated, thin, translucent, glossy, white. *Sculpture*. Longitudinals—there are on each whorl about 17 narrow, straight, rather tumid ribs, parted by furrows of about the same breadth. These ribs run straight down the spire, but are on the body-whorl slightly oblique. This whole system of ribs and furrows ceases abruptly at the edge of the base through a levelling up of the surface. There are many microscopic rounded lines, which are most distinct in the furrows, but especially on the base. Spirals—there are faint

and minute spiral threads, best seen near the suture; and there are also indistinct close-set microscopic threads. The base of the pillar is encircled by a minute sharp thread, which is the scar of the siphonal cut. *Colour* clear, translucent, and glossy white. *Spire* high, narrow, with slightly convex outlines, which are strongly impressed at the suture. *Apex* rather abrupt, blunt and rounded; the extreme point hardly rises above the general curve. *Whorls* 9, rounded, but a little flattened on the sides, and constricted at the top and bottom of each; they are of slow and regular increase; the last is a little larger in proportion than the rest. The base is rounded and a little tumid. *Suture*, a minute line lying in a deep, open, and rounded depression. *Mouth* bluntly pointed above, with a rather broad rounded opening for the canal at the side of and behind the pillar. *Outer lip* rounded, slightly incurved above, patulous and projecting on the base, slightly retreating towards the canal, the edge of which is straight all round. *Pillar* rather short, but not stumpy, scarcely at all twisted, and very little truncated, the end being very much rounded, though there is a slight point on the left side. *Inner lip*. There is a very thin glaze on the body, which runs straight out on the pillar with a thinnish, but distinct edge. H. 0.133. B. 0.04. Penultimate whorl, height 0.02. Mouth, length 0.03, breadth 0.019.

In many of its features this shell is like a minute *Terebra*, but the form of the whorls rather suggests *Cerithium*. Unfortunately the canal is slightly chipped. It is much smaller than *Cerithiopsis costulata*, Möller; the ribs, too, are much smaller and the apex is more turbate. Than *Cerithium Naiadis*, Woodward*, this species is much slimmer, and has not the well-marked spirals.

21. CERITHIUM (BITTIUM) AEDONIUM, n. sp. (Ἀηδόνιος, belonging to a Nightingale.)

St. 135. Oct. 18, 1873. Nightingale Island. Tristão da Cunha Islands. 100–150 fms.

Shell.—Small, narrow, conical, blunt, with faintly convex outlines, which are deeply broken at the sutures, rather abruptly truncate at the base, reticulately tubercled, solid, translucent, glossy, white. *Sculpture*. Longitudinals—there are on the last

* Dr. Gwyn Jeffreys assures me this species of Woodward is really the same as the *Cerithiopsis costulata*, Möll. Not having opportunity now of comparing them, I state the fact on his authority.

whorl 19 rows of small, narrow, but longish, rounded, rather coarse tubercles, parted by furrows, which are shallow, rather unequal, and fully broader than the ribs. There are over the whole surface fine irregular lines of growth, which are, as usual, strongest on the base. Spirals—on all but the first two whorls there are three spiral threads, which rise into tubercles as they cross the longitudinals; they are parted by deep narrow furrows; of these three the two lower are strong, the upper of the two being a little the stronger and more prominent. The third and highest spiral is not materially smaller than the others, but is much less prominent, the whole whorl being at this part constricted. The suture lies immediately above this spiral. Beneath the lower spiral the whorl is sharply constricted, and a very minute plain spiral lies in the bottom of the furrow and immediately above the suture; this minute spiral is the edge of the strongish spiral which encircles the base. Round the base of the pillar is a minute sharp spiral thread, which runs round the back into the columellar canal. There are microscopic spirals over the whole surface. *Colour* pure translucent white. *Spire* is high and narrow; its outlines, which are a good deal interrupted by the sutural constriction, are slightly convex. *Apex*, of $1\frac{1}{2}$ whorls, is tumid, bluntly rounded, a little oblique, and glossy white. *Whorls* 9, rounded, contracted above and constricted below. The base is rather truncate and rounded. *Suture* very minute, but well indicated by the broad open furrow in which it lies. *Mouth* oval, little pointed above, with a small well-rounded canal at the pillar. *Outer lip* sharp, scarcely incurved above, not prominent, but patulous below, angulated at the corner of the canal, round which it is scarcely reverted. *Pillar* straight, prominent, and pretty strong, with a sharp twisted edge at its point. *Inner lip* a mere glaze on the body, but forming a thin distinct edge along the length of the pillar. H. 0·17. B. 0·057. Penultimate whorl, height 0·032. Mouth, length 0·039, breadth 0·025.

This species is more like *Cerithium cinctum*, W., and *C. depauperatum*, W., than any thing else I know. These are both Madeiran species. Its whorls are much more rounded than in either of these. The base is not produced into a rounded cone as in *C. cinctum*, but is rather abruptly truncate and very slightly contracted; it is also plain, and has not the spiral threads which appear on these two species. The contraction of the whorls into the suture makes the outlines of the spire very different, and the apex

(which, as in the case of these two species, is mammillate and distinct from the acute form of *C. reticulatum*, della Chiaje) is more oblique than it is in these.

The last four species, *C. cylindricum*, *C. abruptum*, *C. delicatum*, and *C. ædonium*, I keep here together. They have undeniably the deep oblique siphonal cut on the base toward the point of the pillar which is a very marked feature in *Cerithiopsis*; but the form of the canal is very variable in all the group, and the elongated and sculptured apex, which is a still more characteristic feature of *Cerithiopsis*, is wanting; and thus, in the absence of the animal and operculum, I prefer classing them as above with *Bitium*. I confess, however, that on both of these grounds *Cerithiopsis costulata*, Möll., seems quite as doubtfully entitled to rank as a *Cerithiopsis*.

LITIOPA.

LITIOPA (?) LIMNÆIFORMIS, n. sp.

St. 144 c. Dec. 27, 1873. Lat. 46° 48' S., long. 37° 49' 30'' E. Prince Edward Islands, between Cape of Good Hope and Kerguelen. 50–150 fms.

Shell.—Obliquely ovate, thin, smooth, whitish, horny, with a slight, almost covered umbilical chink. *Sculpture*. There are many faint oblique lines of growth, but none other of any kind. *Colour* whitish, horny. *Spire* conical, slightly scalar. *Apex* small, but bluntly rounded, and neither sharp nor sculptured. *Whorls* $3\frac{1}{2}$, of regular, but rather rapid increase, a little tumid, and convex, but flattened, in a line parallel to the axis; the base is tumid and somewhat produced. *Suture* strong, impressed, and almost a little canaliculate. *Mouth* perpendicular, oval, not at all pointed. *Outer lip* thin, a little incurved above, slightly patulous in front, and projecting beyond the pillar, between which projection and the pillar it retreats as a slight and open sinus. *Pillar* perpendicular, a little hollowed, twisted, and truncate. *Inner lip* spread out over the body-whorl and behind the pillar, so as to conceal and almost close the umbilicus, below which it crosses, with an oblique thin edge, to join the front of the pillar below its twisted truncation. *Umbilicus* not small in itself, but almost quite hidden. H. 0·089. B. 0·06, least 0·047. Penultimate whorl, height 0·02. Mouth, length 0·052, breadth 0·039.

This is another of the unsatisfactory cases where a species is classed under a genus for want of a better. The texture of the shell is somewhat like that of *Litiopa*, but it utterly wants the

pointed and sculptured apex; the truncation of the lip is blunt, and the species much more resembles a *Limnæa* than any thing else. There are no varices, nor any thickening of the outer lip, to connect it with *Alaba* (see Adams' 'Genera,' I. 241, and Ann. & Mag. Nat. Hist. 1862, x. 294, and E. A. Smith, P. Z. S. 1875, p. 537); and the truncated column distinguishes it from *Diala*. Of course if *Alaba* (*Diala*) *picta*, Ad., with a faint approach to a truncation, may be admitted to the subgenus whose characteristic features already at each important point contradict those of the genus itself, it is hard to say what may or may not be united to so elastic a group; but it seems safer at present to classify this species as a *Litiopa*, to which, at the same time, I do not believe it to belong.

CERITHIOPSIS.

1. *C. balteata*, n. sp.

2. *C. fayalensis*, n. sp.

1. CERITHIOPSIS BALTEATA, n. sp.

July 29, 1874. Levuka, Fiji. 12 fms.

Shell.—Small, dumpy, oval, reticulate, tubercled, strong, yellow, with an inferior brown band. *Sculpture*. Longitudinals—there are on the last whorl about twenty rows of tubercles, parted by narrow, deepish furrows; they diminish in number on the upper whorls, but run very straight from whorl to whorl down the spire; they are largest and most widely parted on the penultimate whorl, being rather crowded and narrow on the last. Spirals—on each whorl there are two broad spiral threads, which rise into coarse rounded tubercles, of which the upper row is the stronger. The lower row is coloured brown. They are parted by a strong furrow. On the last whorl the upper spiral divides into two rather feeble ones, and the tubercles on the brown spiral diminish in size. On the contracted base is a small furrow, within which is a spiral broken into flat round tubercles. Within this is a squarish-cut furrow, and within this a small spiral forms the base of the pillar, which hardly projects beyond it. The whole surface of the shell is microscopically cross-hatched with longitudinal lines of growth and spiral scratches. These latter are strong on the point of the pillar. *Colour* is yellowish white, with a broadish spiral band of brown, which embraces the whole lower spiral. The whole surface is in this way pretty equally divided between a white and a brown spiral band. The brown colour is probably more crimson when the shell is fresh. *Spire* is short, contracting rather abruptly, with a convexly curved contour. *Apex* broken.

Whorls 7, excluding those of the embryonic apex, flat, contracted upwards on the spire, on the base contracted downwards and produced. *Suture* invisible, in the bottom of a deep narrow furrow. *Mouth* minute, roundly oval, with a rather large round canal, which turns in at the back of the pillar. *Outer lip* contracted. *Pillar* very short, strong, rounded and pointed. *Inner lip* thick and strong, and on the pillar projecting so as to leave rather a deep fissure behind it. H. 0·087. B. 0·045. Penultimate whorl, height 0·019. Mouth, length 0·016, breadth 0·014.

This beautiful little species very much resembles *C. pulchella*, C. B. Ad., from the West Indies; but that is a slenderer shell, being longer in proportion to its breadth, and has a longer pillar; its whole system of sculpture also is more delicate.

2. CERITHIOPSIS FAYALENSIS, n. sp.

St. 75. July 2, 1873. Lat. 38° 38' N., long. 28° 28' 30" W. Fayal, Azores. 450–500 fms. Sand.

Shell.—Small, narrow, conical, not contracted on the base, reticulated, tubercled, with a marked sutural furrow, of a light ruddy brown. *Sculpture*. Longitudinals—there are on the last whorl from 15 to 25 small, straight, longitudinal ridges, parted by narrow deepish furrows; they cross the whorls a little obliquely, and run pretty straight down the spire from whorl to whorl, with a slight sinistral twist. Spirals—there are on each whorl three equal rounded threads, which rise into rounded tubercles as they cross the longitudinal ridges; they are parted by rather narrow and deepish furrows. The bottom of each whorl is very slightly constricted into the sutural furrow, which is thus a little more distinct than the other furrows; and from this the succeeding whorl projects with a very straight and perpendicular edge. This furrow encircles the edge of the base, which is sharply defined and contracted by a spiral thread, whose rounded edge projects a little prominently on the inner side of the furrow. On the base the microscopic markings, irregular hair-like lines of growth, and very faint spirals are most visible. *Colour* uniform light ruddy brown. *Spire* high, narrow, pointed, very slightly scalar, with very slightly convex contour lines. *Apex* broken. *Whorls* (excluding the embryonic) 11, straight, or very slightly convex on the side; the base is very flat and hardly conical. *Suture* only recognizable from the furrow in which it lies. *Mouth* very small, narrowly oval, with a small, but well-marked sinus at its upper outer corner, and with a largish and

deepish canal turning in behind the pillar. *Outer lip* not expanded above, and but little so on the base; strongly furrowed by the spirals of the sculpture. *Pillar* short, stoutish, well rounded, fine-edged, obliquely truncate, and sharp-pointed. *Inner lip* a thin glaze on the body, but becoming thicker toward the point of the pillar. H. 0·173. B. 0·04. Penultimate whorl, height 0·02. Mouth, length 0·029, breadth 0·015.

This species seems to be somewhat variable in size, one of the five specimens which represent it being a good deal larger than the rest, with the same number of whorls. Another specimen is more dumpily conical.

It has some resemblance in a general way to *C. metaxa*, della Chiaje, but in that the contour lines are more regularly conical, the spire is not at all scalar, the whorls are convexly rounded, there is no deep sutural furrow, the tuberculations are long across the shell, and each whorl has four, not three spirals; the form of the base is a good deal like, but the pillar is shorter, stronger, straighter, rounder, and has not the sharp flanged edge of that species. From *C. tubercularis*, Mont., which it resembles in sculpture, it differs not only in its slender form, but in the absence of the circumcolumnar thread on the base.

Note on an Abnormal (Quadriradiate) Specimen of *Amblypneustes formosus*. By Prof. F. JEFFREY BELL, M.A., F.R.M.S.

[Read April 15, 1880].

(PLATE V.)

IT is now forty-three years since that accurate and painstaking zoologist Rudolph Philippi described a monstrous specimen of *Echinus melo**, which was especially remarkable for the excentric position of the mouth and of the anus, and for the almost complete disappearance of one of the five segments of which the test of every Echinid is typically composed. Being at present engaged in an examination of the group to which the name of Temnopleuridæ has been applied, I have, among others, taken in hand the three specimens of *Amblypneustes formosus*, which, named by Prof. Alex. Agassiz, have come as an earnest of the harvest of the 'Challenger' Expedition. The smallest of these at once arrested my attention by the curious asymmetry which revealed

* Arch. für Naturges. iii. (1837), p. 241, pl. v.